

GUPTA et al. 1762
Appln. No. 10/055,613
September 25, 2003

IN THE CLAIMS:

Claims 1-46 (Canceled).

47. (Currently Amended) A process for imparting colour to a gemstone, the process comprising coating the gemstone with one or more colour inducing/enhancing materials in the form of a film of thickness ~~in the range of 10 nm to 500 nm~~ and subjecting the coated gemstone to heat treatment at a temperature in the range of about 700°C up to about ~~1200-1999~~°C for a time in the range of about 30 minutes to about ~~10 hours~~ ~~90 minutes~~ in air or an oxidizing atmosphere to obtain a coloured gemstone.

48. (Previously Presented) A process as claimed in claim 47 wherein the gemstone is selected from topaz and sapphire.

49. (Previously Presented) A process as claimed in claim 47 wherein the gemstone is cleaned before coating.

50. (Previously Presented) A process as claimed in claim 47 wherein two or more colour inducing/enhancing materials are coated on to the gemstone in the form of films at discrete portions on the gemstone prior to the heat treatment and the coated gemstone then subjected to heat treatment to obtain coloured gemstones with two or more discrete colors imparted thereto.

GUPTA et al,
Appln. No. 10/055,613
September 25, 2003

51. (Previously Presented) A process as claimed in claim 50 wherein the said two or more colour inducing/enhancing films are of varying thickness depending on the intensity of colour induction/enhancement desired in the gemstone.

52. (Previously Presented) A process as claimed in claim 47 wherein the colour inducing/enhancing material is incorporated into the crystal lattice of the substrate.

53. (Previously Presented) A process as claimed in claim 47 wherein the colour inducing/enhancing material is chemically bonded onto the surface of the substrate.

54. (Currently Amended) A process as claimed in claim ~~47~~ wherein the colour inducing/enhancing material is selected from the group consisting of metal, a metal oxide, a metallic compound, and an alloy.

55. (Previously Presented) A process as claimed in claim 54 wherein the metal or metal oxide is a transition metal or a transition metal oxide respectively.

56. (Previously Presented) A process as claimed in claim 54 wherein the metal is selected from the group consisting of cobalt, cobalt containing material, iron, iron containing material, chromium, chromium containing material, and any mixture thereof.

57. (Previously Presented) A process as claimed in claim 54 wherein the metal oxide is selected from cobalt oxide and iron oxide.

GUPTA et al.
Appln. No. 10/055,613
September 25, 2003

58. (Previously Presented) A process as claimed in claim 56 wherein the cobalt containing material is selected from the group consisting of cobalt-chromium and cobalt oxide-chromium oxide.

59. (Previously Presented) A process as claimed in claim 56 wherein the iron containing material is selected from the group consisting of iron-nickel-chromium and iron oxide-nickel oxide-chromium oxide.

60. (Previously Presented) A process as claimed in claim 50 wherein the colour inducing/enhancing material film is selected from chromium or chromium oxide film.

61. (Previously Presented) A process as claimed in claim 47 wherein the colour inducing/enhancing is coated onto the gemstone in the form of multiple films of different metals or alloys at discrete and separate portions of the gemstone.

62. (Previously Presented) A process as claimed in claim 61 wherein one metal film coated on the gemstone is cobalt and another film is of chromium.

63. (Previously Presented) A process as claimed in claim 61 wherein one metal film coated on the gemstone is iron and another film is of chromium-nickel.

64. (Currently Amended) A process as claimed in claim 62 wherein the gemstone comprises topaz, the coated topaz being heated at a temperature range

GUPTA et al.
Appl. No. 10/055,613
September 25, 2003

~~between 1000 to~~ 1080°C in air ~~for 3 hours~~ or an inert or reducing gas for a time in the range of ~~30 minutes to 90 minutes~~ to induce London, Baby, Swiss and Sky blue colours.

65. (Currently Amended) A process as claimed in claim 47 wherein the gemstone comprises topaz, the topaz being coated with a film of a cobalt or a cobalt containing material and being heated at a temperature in the range of 1000 to ~~4080~~1100°C in the presence of air ~~or a reducing or an inert gas~~ for a time in the range of 30 minutes to ~~5 hours~~90 minutes to induce light blue to dark blue colour.

66. (Currently Amended) A process as claimed in claim 47 wherein the gemstone comprises topaz, the topaz being coated with a film of a cobalt or a cobalt containing material and being heated at a temperature in the range of 900 to 1000°C in of air or an oxidising gas for a time in the range of 30 minutes to ~~3 hours~~90 minutes to obtain light green to dark green colour.

67. (Currently Amended) A process as claimed in claim 47 wherein the gemstone comprises topaz, the topaz being coated with a film of a cobalt or a cobalt containing material and being heated at a temperature in the range of ~~950~~950 to 1050°C in air to induce green-blue or blue-green colour in the topaz.

68. (Currently Amended) A process as claimed in claim 47 wherein the gemstone comprises topaz and a film of iron containing material is coated thereon and heat treatment is carried out in air or oxidising gas at a temperature in the range of 700

GUPTA et al.
Appln. No. 10/055,613
September 25, 2003

to 900°C for 30 min. to 3 hours~~90 minutes~~ to obtain colours from yellow to orange and reddish-orange.

69. (Currently Amended) A process as claimed in claim 47 wherein the gemstone comprises topaz and a film of iron material is coated on one portion thereof, followed by chromium and nickel film at another portion of the gemstone and heat treatment is carried out in air or oxidising gas at a temperature in the range of 700 to 900°C for 30 min. to 3 hours~~90 minutes~~ to obtain colours from imperial to reddish imperial.

70. (Currently Amended) A process as claimed in claim 47 wherein the gemstone comprises topaz and is heated at a temperature in the range of 700°C to ~~4050~~900°C in air or an oxidising gas for a time in the range of 30 minutes to 3 hours~~90 minutes~~ to induce yellow to orange and orange-red colours~~green colour~~.

71. (Currently Amended) A process and claimed in claim ~~54~~57 wherein the gemstone is topaz, and is coated with films of different colour inducing/enhancing materials and heated at a temperature in the range of 700°C to 1050°C in air or an oxidising gas for a time in the range of 30 minutes to 90 minutes to obtain bi-coloured or multicoloured gemstones.

72. (Previously Presented) A process as claimed in claim 47 wherein the gemstone comprises sapphire and the colour obtained ranges from dark blue to light

GUPTA et al.
Appln. No. 10/055,613
September 25, 2003

blue, or dark green to light green or a mixture thereof depending on the time and temperature cycle employed for the treatment.

73. (Previously Presented) A process as claimed in claim 50 wherein the colour inducing/enhancing film is coated onto the gemstone by physical vapour deposition and/or chemical vapour deposition.

74. (Previously Presented) A process as claimed in claim 47 wherein the gemstone is cleaned to remove dust, grease or any other foreign contaminant adhering to the gemstone surface.